# Supplementary Material of Lifelong Histopathology Whole Slide Image Retrieval via Distance Consistency Rehearsal

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## 1 Evaluation metrics

**Table 1.** Metrics used in evaluation of returned queue consistency

| Metric Name | Definition | Description |
|---|---|---|
| Spearman's Rank Correlation Coefficient | $\rho_{i,j} = 1 - \dfrac{6\sum d_k^2}{n(n^2-1)}$ | $d_k$ is the difference between the ranks of retrieval sequence of $i$-th task after $j$ tasks' training, and $n$ is the number of instance of each sequence. |
| **Usage in Application** | $SRC = \dfrac{1}{n-1}\sum_{i=1}^{n-1}\left(\dfrac{1}{n-i}\sum_{j=i+1}^{n}\rho_{i,j}\right)$ | |
| Kendall's Rank Correlation Coefficient | $\tau_{i,j} = \dfrac{C-D}{\frac{n(n-1)}{2}}$ | $C$ is the number of concordant pairs of retrieval sequence of $i$-th task after $j$ tasks' training, $D$ is the number of discordant pairs, and $n$ is the number of instance of each sequence. |
| **Usage in Application** | $KRC = \dfrac{1}{n-1}\sum_{i=1}^{n-1}\left(\dfrac{1}{n-i}\sum_{j=i+1}^{n}\tau_{i,j}\right)$ | |

## 2   Implementation details

**Table 2.** Hyperparameters and corresponding values.

| Hyperparameter Name | Hyperparameter Value |
|---|---|
| Patch Sampling Number per WSI | 2048 |
| Pair-wise Loss Weight | 1.0 |
| Cross-entropy Loss Weight | 1.0 |
| Distance Consistency Loss Weight | 0.01 |
| Learning Rate | 1e-5 |
| Buffer Size | 100, 200, 300 |
| Batch Size | 10 |
| Minibatch Size | 30 |
| Number of Epochs | 70 |
| Optimizer | Adam |
| Scheduler | StepLR |